Remarks/Arguments

Claims 1-4, 7, 8, 11, 12, 15–18, 21–24, 26–30, and 33–40 are pending and at issue in the present application.

Applicants have amended claims 1, 8, 15, 23, 27 and 36 to correct typographical errors. No new matter has been added by these amendments.

Claims 15, 27, and 36 have been amended to address the examiner's structural limitation argument given during an examiner interview on February 10, 2004. The amendments are fully supported by the specification and do not add any new matter.

Applicants respectfully traverse the rejection of the claims at issue as obvious over one or more of Coleman et al., Gorlich et al., Motomura, Noel et al., Dworak et al., and Wildmoser.

Claim 1, and claims 2–4 and 7 dependent thereon, as amended, specify a method of severing and sealing a plurality of layers of film formed of a thermoplastic material. The method includes the step of heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film. The temperature is sufficient to melt but not to burn a thermoplastic material. The method further includes the steps of feeding the plurality of layers of the film between the heated cutting edge implement and an opposing surface and moving the heated cutting edge implement and the opposing surface relative to one another to pinch the plurality of layers of film therebetween. Still further, the method includes the step of suspending any relative lateral movement between the heated cutting edge implement, the plurality of layers of film, and the opposing surface, while relatively biasing the heated cutting edge implement and the opposing surface together with the plurality of layers of film pinched therebetween. The plurality of layers of film are pinched between the cutting edge implement and the opposing surface until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the opposing surface, and seals the plurality of layers of the film together.

Claim 8, and claims 11 and 12 dependent thereon, as amended, recite a method of severing and sealing a plurality of layers of film. The method includes the step of heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing

and sealing a plurality of layers of the film. The temperature is sufficient to melt but not to burn a film. The method further includes the steps of feeding the plurality of layers of the film between the heated cutting edge implement and an opposing surface and moving the heated cutting edge implement and the opposing surface relative to one another to pinch the plurality of layers of the film therebetween. The method also includes the step of relatively biasing the heated cutting edge implement and the opposing surface together with the plurality of layers of film pinched therebetween, until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers and seals the resulting severed edges.

Claim 15, and claims 16–18, 21, and 22 dependent thereon, as amended, are directed toward an apparatus for severing and sealing a plurality of layers of film formed of a thermoplastic material. The apparatus includes a cutting edge implement and a controller for regulating the temperature of the cutting edge implement. The cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film, the temperature being sufficient to melt but not to burn a thermoplastic material. The apparatus also includes an anvil and means for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil. Means are also provided for moving the heated cutting edge implement and the anvil relative to one another to pinch the plurality of layers of film therebetween. The apparatus also includes means for suspending any relative lateral movement between the heated cutting edge implement, the film, and the anvil, while pressing the heated cutting edge implement toward the anvil with the film pinched therebetween. The film is pinched between the cutting edge implement and the anvil until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the anvil, and seals the plurality of layers of the film together.

Claim 23, and claims 24 and 26 dependent thereon, as amended, recite a method of severing and sealing a plurality of layers of film formed of a thermoplastic material. One step in the method comprises the step of heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film. The temperature is sufficient to melt but not to burn a thermoplastic material. The

method further includes the step of pinching the plurality of layers of the film between a substrate and the cutting edge implement wherein the implement is heated to the temperature between about 600° F and about 800° F. The cutting edge implement is pressed toward the substrate with the plurality of layers of the film pinched therebetween until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the substrate, and seals the plurality of layers of the film together.

Claim 27, and claims 28–30 and 33–35 dependent thereon, as amended, specify an apparatus for severing and sealing a plurality of layers of film formed of a thermoplastic material. The apparatus is comprised of a cutting edge implement and a controller for regulating the temperature of the cutting edge implement. The cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film, the temperature being sufficient to melt but not to burn a thermoplastic material. The apparatus includes an insulating insert for supporting the heated cutting edge implement, a base member for supporting the insulating insert, and an anvil. The anvil is placed adjacent to the heated cutting edge implement on a side of the heated cutting edge implement opposite from the insulating insert and the base member. The apparatus also includes means for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil and means for moving the heated cutting edge implement and the anvil relative to one another to pinch the plurality of layers of the film therebetween. Means are also provided for suspending any relative lateral movement between the heated cutting edge implement, the film, and the anvil, while pressing the heated cutting edge implement toward the anvil with the plurality of layers of the film pinched therebetween. Relative lateral movement is suspended until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the anvil, and seals the plurality of layers of the film together.

Claim 36, and claims 37–40 dependent thereon, as amended, are directed towards an apparatus for severing and sealing a film formed of a thermoplastic material. The apparatus is comprised of a cutting edge implement and a controller for regulating the temperature of the cutting edge implement. The cutting edge implement is heated to a temperature between

about 600° F and about 800° F for severing and sealing a plurality of layers of film, the temperature being sufficient to melt but not to burn a thermoplastic material. The apparatus includes an anvil and feed rollers for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil. Additionally, at least one actuator is provided for moving the heated cutting edge implement and the anvil relative to one another to pinch the plurality of layers of film therebetween, and for pressing the heated cutting edge implement toward the anvil with the plurality of layers of the film pinched therebetween. The cutting edge is pressed toward the anvil until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the anvil, and seals the resulting severed edges.

None of the cited references discloses or suggests, either singly or in combination, an apparatus or method to contemporaneously seal and cut a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but does not burn thermoplastics, as specified by the claims.

In fact, Coleman et al. describes only a method of severing and sealing a plurality of layers of film by way of a heated blade (120) that pinches webs (28, 30 and 34) against an anvil roller (122) (col. 5, lines 13–28). No temperature range is disclosed within which the blade should be heated.

Gorlich et al. discloses a method and apparatus for packaging meat utilizing non-simultaneous cutting and sealing steps of a film to a tray (col. 7, lines 22–23). Indeed, Gorlich et al. also discloses different temperature ranges for the cutting and sealing steps. In one embodiment, a "conventional heat sealing operation" is used (col. 7, lines 18–19) to seal the film (92) to a tray (55) with a cutter (88) to cut the film. The differentiation in temperature between the sealer (86) and cutter (88) is apparent from the need to supply a coolant to the cutter so the operation of the cutter is not "adversely affected by the ambient heat within the assembly which is greatly augmented by the heat created by the sealing operation" (col. 7, lines 33–39).

In a second embodiment, Gorlich et al. utilizes the aforementioned sealer (86) and an alternate cutting system (288) that comprises a heater (302) extending along the periphery of a blade (290). A temperature range of about 600°F to 900°F, which is dependent on the

material to be cut, is to be used by the cutting system (288) to cause plastic vaporization. The sealer (88) and alternate cutting system (288) utilize different temperature ranges to perform sealing and cutting steps that the present invention can perform in one simultaneous step within one temperature range. In one example, Gorlich et al. teaches that a certain plastic layer could be sufficiently softened to be sealed to other layers at a temperature of approximately 250°F, while the same plastic would have a cutting temperature of about 800°F (Col. 10, lines 7–20).

Motomura generally teaches a cutter cleaning apparatus for a filling machine. The disclosure refers to a sealer that produces a tubular packaging material formed by continuously sealing in a longitudinal direction. After the packaging material is filled, the packaging material is sealed laterally at predetermined levels. Subsequently, a cutting knife cuts the packaging material between two seal lines formed at each laterally sealed portion.

Noel et al. discloses a method and apparatus for packaging products such as food. A securing device (30) heat seals a web to a tray to enclose the contents of the package. An apparatus is also utilized to raise a portion of the web located adjacent to the sealed portion during, immediately before, or immediately after the securing step. A separate severing device (46) then cuts the web at the elevated portion by way of a conventional cutting tool or a heated cutting element (Col. 7, lines 48–55).

Dworak et al. is directed toward a method and apparatus for sealing polyethelene at high speeds. A heating element (108) moves radially into a drum slot (106) that is covered by film shields (148) to prevent direct contact between the heating element (108) and plastic film (22). A dual drum chain (78) moves a separate knife block assembly (154) into position to perforate the center of a heat seal with serrated edges. Alternatively, a cut-off knife assembly could be used to eliminate the perforation step. Dworak et al. also teaches that the separate heating element (108) heats the film to a temperature in the range of 250°F to effectively liquefy and seal the film.

Wildmoser teaches a sealing apparatus for cutting and sealing thermoplastic sheets under tension. A heated impulse wire (40) operates to cut through thermoplastic sheets under tension that are situated between two silicone rubber sealing members (38). The heater wire (40) also supplies sufficient heat in the adjacent areas on each side of the heater wire to fuse the respective ends of the thermoplastic sheets (18a, 20a) to form a heat seal on both sides of

the heater wire. Additionally, Wildmoser only discloses a temperature range of 350°F to 550°F to seal the thermoplastic sheets.

The examiner argued in an interview conducted on February 10, 2004, that "[t]he heated cutting tool of Gorlich used on multiple layers of material would inherently seal the layers during the process of severing the layers." Also, the examiner contended in the Office Action dated December 17, 2003, on pages 3, 5, 6, and 8, that "it is deemed inherent that the references cited will seal the thermoplastic material without burning the thermoplastic material in the same manner as the applicant's invention because the same physical elements are met." Applicant disagrees with the examiner's characterization of the art and notes that every cited item of art teaches the vaporization and subsequent burning of thermoplastic sheets. Indeed, Gorlich et al., Dworak et al. and Wildmoser teach that the sealing of thermoplastic films should be undertaken at lower temperatures than applicants are claiming. Further, applicants claimed range of about 600°F to about 800°F has been used in the prior art only for the vaporization of plastics. The presently claimed invention of melting but not burning at ranges typically used for burning or vaporizing thermoplastics is a significant step away from the teachings of the prior art. Under controlling Federal Circuit precedent, "proceeding contrary to the accepted wisdom of the prior art . . . is strong evidence of nonobviousness." See *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1552 (Fed. Cir. 1983).

Further, because none of the prior art discloses or suggests that it would be desirable or even possible to provide an apparatus or method to contemporaneously seal and cut a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but does not burn thermoplastics, as specified by the claims at issue, it is evident that the claims are not obvious thereover. The prior art must disclose at least a suggestion of an incentive for the claimed combination of elements in order for a *prima facie* case of obviousness to be established. See *In re Sernaker*, 217 U.S.P.Q. 1 (Fed. Cir. 1983) and Ex *Parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. 1985). Accordingly, the obviousness rejection should be withdrawn.

An early and favorable action on the merits is respectfully requested.

Respectfully submitted,

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